CLAIMS

What is claimed is:

1. A financial transaction card that is transparent or translucent to human viewing yet detectable by automated card processing equipment, comprising:

a substantially planar material sheet having upper and lower surfaces bounded by a continuous peripheral edge;

said material sheet having one or more areas that are at least minimally transparent or translucent to human viewing; and

a filter associated with at least one of said one or more areas, said filter providing sufficient opacity to light that is used by card sensors in said automated card processing equipment to render said card detectable by said equipment.

2. A financial transaction card in accordance with Claim 1 wherein said card transmits human visible light with at least about 15% transmittance.

3. A financial transaction card in accordance with Claim 1 wherein said automated card processing equipment includes card embossing/encoding machines having source/detector pairs operating in a light wavelength range of about 830-1100 nm, and wherein said filter has an opacity relative to one or more specific wavelengths within said range of not substantially less than about 1.0.

4. A financial transaction card in accordance with Claim 3 wherein said one or more specific wavelengths include about 920 nm and about 950 nm.

5. A financial transaction card in accordance with Claim 1 wherein said automated card processing equipment includes card readers having source/detector pairs operating in a light wavelength range of about 750-1200 nm, and wherein said filter has an opacity relative to one or more specific wavelengths within said range of not substantially less than about 1.0.

6. A financial transaction card in accordance with Claim 5 wherein said one or more specific wavelengths include about 890 nm and about 950 nm.

7. A financial transaction card in accordance with Claim 1 wherein said automated card processing equipment includes card embossing/encoding machines having source/detector pairs operating in a light wavelength range of about 830-1100 nm, and card readers having source/detector pairs operating in a light wavelength range of about 750-1200 nm, and wherein said filter has an opacity relative to one or more specific wavelengths within said 750-1200 nm range of not substantially less than about 1.0.

8. A financial transaction card in accordance with Claim 7 wherein said one or more specific wavelengths include about 890 nm, about 920 nm, and about 950 nm.

9. A financial transaction card in accordance with Claim 1 wherein said filter is a light absorbing material, a light reflecting material, a light deflecting material, or a combination of two or more such materials.

10. A financial transaction card in accordance with Claim 1 wherein said filter is formed as a filter coating, film or deposition applied or secured to said material sheet.

11. A financial transaction card in accordance with Claim 10 wherein said filter is a clear, light absorbing material providing the requisite light filtering properties.

12. A financial transaction card in accordance with Claim 10 wherein said filter is formed from a light absorbing dye.

13. A financial transaction card in accordance with Claim 10 wherein said filter is formed from a light reflecting material.

14. A financial transaction card in accordance with Claim 10 wherein said filter is formed from a light scattering material.

15. A financial transaction card in accordance with Claim 1 wherein said filter is formed from a light filtering material disbursed through all or a portion of said material sheet.

16. A method for manufacturing a financial transaction card that is transparent or translucent to human viewing yet detectable by automated card processing equipment, comprising the steps of:

forming a substantially planar material sheet having upper and lower surfaces bounded by a continuous peripheral edge;

said material sheet being formed with one or more areas that are least minimally transparent or translucent to human viewing; and

associating a filter with at least a portion of said material sheet, said filter providing sufficient opacity to light that is used by card sensors in said automated card processing equipment to render said card detectable by said equipment.

17. A method in accordance with Claim 16 wherein said card transmits human visible light with at least about 15% transmittance.

18. A method in accordance with Claim 16 wherein said automated card processing equipment includes card embossing/encoding machines having source/detector pairs operating in a light wavelength range of about 830-1100 nm, and wherein said filter is constructed to have an opacity relative to one or more specific wavelengths within said range of not substantially less than about 1.0.

19. A method in accordance with Claim 18 wherein said one or more specific wavelengths include about 920 nm and about 950 nm.

20. A method in accordance with Claim 16 wherein said automated card processing equipment includes card readers having source/detector pairs operating in a light wavelength range of about 750-1200 nm, and wherein said filter is constructed to have an opacity relative to one or more specific wavelengths within said range of not substantially less than about 1.0.

21. A method in accordance with Claim 20 wherein said one or more specific wavelengths include about 890 nm and about 950 nm.

22. A method in accordance with Claim 16 wherein said automated card processing equipment includes card embossing/encoding machines having source/detector pairs operating in a light wavelength range of about 830-1100 nm, and card readers having source/detector pairs operating in a light wavelength range of about 750-1200 nm, and wherein said filter is constructed to have an opacity relative to one or more specific wavelengths within said 750-1200 nm range of not substantially less than about 1.0.

23. A method in accordance with Claim 22 wherein said one or more specific wavelengths include about 890 nm, about 920 nm, and about 950 nm.

24. A method in accordance with Claim 16 wherein said filter is a light absorbing material, a light reflecting material, a light deflecting material, or a combination of two or more such materials.

25. A method in accordance with Claim 16 wherein said filter is formed as a filter coating, film or deposition applied or secured to said material sheet.

26. A method in accordance with Claim 25 wherein said filter is formed from a clear light absorbing material providing the requisite light filtering properties.

27. A method in accordance with Claim 25 wherein said filter is formed from a light absorbing dye.

28. A method in accordance with Claim 25 wherein said filter formed from a light reflecting material.

29. A method in accordance with Claim 25 wherein said filter formed from a light scattering material.

30. A method in accordance with Claim 16 said filter is formed from a light filtering material disbursed through all or a portion of said material sheet.

31. A financial transaction card that is transparent or translucent to human viewing yet detectable by automated card processing equipment, comprising:

a sheet of material having one or more areas that are at least minimally transparent or translucent to human viewing; and

means associated with at least one of said areas for rendering said card detectable by source/detector pairs in said automated processing equipment.

32. A financial transaction card in accordance with Claim 31 wherein said means is a filter applied to said material sheet as a liquid coating.

33. A financial transaction card in accordance with Claim 32 wherein said filter is made from a light absorbing dye material dissolved in a liquid coating material at a dye-to-coating weight ratio of up to about 20%.

34. A financial transaction card in accordance with Claim 32 wherein said filter is made from a light absorbing dye material dissolved in a liquid coating material at a dye-to-coating weight ratio of between about 0.2-5.0%.

35. A financial transaction card in accordance with Claim 32 wherein said filter is made from a light absorbing dye material dissolved in a liquid coating material at a dye-to-coating weight ratio of between about 0.5-3.5%.

36. A financial transaction card in accordance with Claim 32 wherein said filter is made from a light absorbing dye material dissolved in a liquid coating material at a weight ratio of about 1.0-2.5%.

37. A financial transaction card in accordance with Claim 32 wherein said liquid coating comprises a plastic resin-based coating material.

38. A financial transaction card in accordance with Claim 32 wherein said liquid coating is applied to said material sheet by screen printing.

39. A financial transaction card in accordance with Claim 38 wherein said screen printing is performed using a screen mesh size of between about 90-390 mesh.

40. A financial transaction card in accordance with Claim 38 wherein said filter is made from a light absorbing dye material dissolved in a liquid coating material and said screen printing is performed using a screen mesh size of about 195 mesh.

41. A financial transaction card in accordance with Claim 38 wherein said filter is made from a light absorbing dye material dissolved in a liquid coating material and said screen printing is performed using a screen mesh size of about 305 mesh.

42. A financial transaction card in accordance with Claim 33 wherein said liquid coating material is a plastic resin-based coating.

43. A financial transaction card in accordance with Claim 33 wherein a colorant is added to said filter to provide a desired color or tint.

44. A financial transaction card in accordance with Claim 43 wherein said dye is a dye material that produces a yellow tint and wherein said colorant is a violet colorant material that combines with said yellow tint of said dye material to provide a neutral gray tint in said card.

45. A financial transaction card in accordance with Claim 33 wherein between about 2-4 layers of said dye material and said liquid coating material are applied to said material sheet.

46. A financial transaction card in accordance with Claim 33 wherein said card has an opacity of at least approximately 1.0 relative to one or more selected light wavelengths corresponding to the output of light sources used in said automated card processing equipment.

47. A financial transaction card in accordance with Claim 46 wherein said card has an opacity of at least approximately 1.0 relative to light wavelengths of about 890 nm and about 950 nm.

48. A financial transaction card in accordance with Claim 46 wherein said card has an opacity of at least approximately 1.0 relative to light wavelengths of about 920 nm and about 950 nm.

49. A financial transaction card in accordance with Claim 43 wherein said colorant is a dye colorant.

50. A financial transaction card in accordance with Claim 43 wherein said colorant is a fluorescent material.

51. A financial transaction card in accordance with Claim 43 wherein said colorant is a light scattering material.

52. A financial transaction card in accordance with Claim 43 wherein said colorant includes a fluorescent material and a light scattering material.

53. A financial transaction card in accordance with Claim 32 wherein said filter includes a fluorescent material.

54. A financial transaction card in accordance with Claim 32 wherein said filter includes a light scattering material.

55. A financial transaction card in accordance with Claim 32 wherein said filter includes a fluorescent material and a light scattering material.

56. A financial transaction card in accordance with Claim 32 wherein said filter includes an Ultraviolet light absorber.

57. A financial transaction card in accordance with Claim 32 wherein said filter is made from an organic solvent-soluble, near Infrared absorption dye and an Ultraviolet light absorbing material dissolved in a plastic resin-based coating material.

58. A financial transaction card in accordance with Claim 32 wherein said coating is made from a vinyl resin-based coating material that includes (by weight) about 20-25% vinyl resins, about 35-40% aromatic petroleum distillates, about 5-10% cyclohexanone, about 5-10% diacetone alcohol, about 5-10% gamma butyrolactone, less than about 5% napthalene, and about 2% aliphatic petroleum distillates, and wherein said coating is further made from a thinner comprising all of the components of said coating material at the same ratios, with the exception of said vinyl resins which are not present in said thinner.

59. A financial transaction card in accordance with Claim 58 wherein said filter is made from one or more layers comprising a mixture of a first organic solvent-soluble, near Infrared absorption dye, a second organic solvent-soluble, near Infrared absorption dye, said second dye having more Ultraviolet light and/or heat stability than said first dye, an organic solvent-soluble red colorant, an organic solvent-soluble blue colorant, said thinner and said vinyl resin-based coating material.

60. A financial transaction card in accordance with Claim 59 wherein the respective proportions of said first dye, said second dye, said red colorant, said blue colorant, said thinner, and said vinyl resin-based coating material in said mixture are about 22:3:0.25:0.35:110:990 by weight, and wherein two filter layers of said mixture are used to produce a card having an opacity of approximately 0.4 at a wavelength of about 550 nm, approximately 1.3 at a wavelength of about 890 nm, and approximately 1.7 at a wavelength of about 950 nm.

61. A financial transaction card in accordance with Claim 59 wherein the respective proportions of said first dye, said second dye, said red colorant, said blue colorant, said thinner, and said vinyl resin-based coating material in said mixture are about 22:3:0.25:0.35:110:990 by weight, and wherein three filter layers of said mixture are used to produce a card having an

opacity of approximately 0.6 at a wavelength of about 550 nm, approximately 1.5 at a wavelength of about 890 nm and approximately 1.9 at a wavelength of about 950 nm.

62. A financial transaction card in accordance with Claim 59 wherein the respective proportions of said first dye, said second dye, said red colorant, said blue colorant, said thinner, and said vinyl resin-based coating material in said mixture are about 22:3:0.25:0.35:110:990 by weight, and wherein four filter layers of said mixture are used to produce a card having an opacity of approximately 0.6 at a wavelength of about 550 nm, approximately 2.0 at a wavelength of about 890 nm and approximately 2.5 at a wavelength of about 950 nm.

63. A financial transaction card in accordance with Claim 58 wherein said filter is made from one or more layers comprising a mixture of an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble Ultraviolet (UV) light absorber, an organic solvent-soluble fluorescent blue colorant, an organic solvent-soluble fluorescent red colorant, said thinner and said vinyl resin-based coating material.

64. A financial transaction card in accordance with Claim 63 wherein the respective proportions of said dye, said UV absorber, said blue colorant, said red colorant, said thinner, and said vinyl resin-based coating material in said mixture are about 13:4.33:21.66:21.66:130:633 by weight, and wherein three filter layers of said mixture are used to produce a card having an opacity of approximately 0.2 at a wavelength of about 550 nm and approximately 1.0 at a wavelength of about 950 nm.

65. A financial transaction card in accordance with Claim 58 wherein said filter is made from one or more layers comprising a mixture of an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble Ultraviolet light (UV) absorber, and said vinyl resin-based coating material.

66. A financial transaction card in accordance with Claim 65 wherein the respective proportions of said dye, said UV absorber, and said vinyl resin-based coating material in said mixture are about 15:4.5:980.5 by weight, and wherein one filter layer of said mixture is used

to produce a card having an opacity of approximately 0.2 at a wavelength of about 550 nm and approximately 1.2 at a wavelength of about 950 nm.

67. A financial transaction card in accordance with Claim 58 wherein said filter is disposed on one side of said material sheet and a light scattering film is disposed on the other side of said material sheet.

68. A financial transaction card in accordance with Claim 67 wherein said filter is made from one or more layers comprising a first mixture of an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble Ultraviolet (UV) light absorber, an organic solvent-soluble fluorescent blue colorant, an organic solvent-soluble fluorescent red colorant, said thinner and said vinyl resin-based coating material, and wherein said light scattering film is made from one or more layers comprising a second mixture of a translucent light scattering material, an organic solvent-soluble fluorescent whitening agent and said vinyl resin-based coating material.

69. A financial transaction card in accordance with Claim 68 wherein the respective proportions of said dye, said UV absorber, said fluorescent blue colorant, said fluorescent red colorant, said thinner, and said vinyl resin-based coating material in said first mixture are about 13:4.33:65:21.66:130:633 by weight, wherein the respective proportions of said light scattering material, said fluorescent whitening agent and said vinyl resin-based coating material in said second mixture are about 90:2.5:907.5, wherein one filter layer of said first mixture and said light scattering film coated with said second mixture are used to produce a card having an opacity of approximately 0.8 at a wavelength of about 550 nm and approximately 1.5 at a wavelength of about 950 nm.

70. A financial transaction card in accordance with Claim 32 wherein said filter is made from an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble Ultraviolet light absorbing material, and one or more organic solvent-soluble colorants dissolved in a vinyl resin-based coating.

71. The financial transaction card of Claim 32 wherein said filter is made from an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble Ultraviolet light absorbing material, and one or more organic solvent-soluble fluorescent materials dissolved in one or more vinyl resin-based coatings.

72. The financial transaction card of Claim 32 wherein said filter is made from an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble Ultraviolet light absorbing material, and one or more light scattering materials dissolved in one or more vinyl resin-based coatings.

73. The financial transaction card of Claim 32 wherein said card transmits human visible light with at least about 15% transmittance.

74. A financial transaction card that is transparent or translucent to human viewing yet detectable by automated card processing equipment, comprising:

a pair of substantially planar material sheets each having opposing first surfaces and non-opposing second surfaces, said surfaces being bounded by a continuous peripheral edge;

said material sheets being at least minimally transparent or translucent to human viewing;

a light filtering coating formed on one or both of said first surfaces;

printed graphics formed over said second surfaces;

clear protective overlay sheets formed over said printed graphics; and

said card providing sufficient opacity to light that is detectable by sensors in said automated card processing equipment to render said card detectable by said equipment.

75. The financial transaction card of Claim 74 wherein there is a light filtering coating formed one each of said first surfaces.

76. The financial transaction card of Claim 74 further including a light filtering coating formed on one or both of said second surfaces.

77. The financial transaction card of Claim 76 wherein there is a light filtering coating formed on each of said second surfaces.

78. The financial transaction card of Claim 74 wherein said light filtering coating is a light absorbing coating.

79. The financial transaction card of Claim 75 wherein said light filtering coatings are light absorbing coatings.

80. The financial transaction card of Claim 76 wherein said light filtering coating on one or both of said first surfaces is a light absorbing coating and said light filtering coating on one or both of said second surfaces is a light scattering coating.

81. The financial transaction card of Claim 77 wherein said light filtering coating on one or both of said first surfaces is a light absorbing coating and said light filtering coatings on said second surfaces are light scattering coatings.

82. The financial transaction card of Claim 78 wherein said light absorbing coating includes a light absorbing dye.

83. The financial transaction card of Claim 82 wherein said light absorbing coating includes a colorant.

84. The financial transaction card of Claim 83 wherein said light absorbing coating includes a light scattering material.

85. The financial transaction card of Claim 81 wherein one of said light scattering coatings comprises a pearlescent ink material and the other of said light scattering coatings comprises a pearlescent pigment material .

86. The financial transaction card of Claim 85 wherein one of said light scattering coatings comprises a silica powder.

87. The financial transaction card of Claim 77 wherein:

(1) there is a light filtering coating formed on one of said first surfaces that is made from a filtering mixture that includes an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble blue colorant, an organic solvent-soluble red colorant, an organic solvent-soluble Ultraviolet (UV) light absorber, a BHT preservative, a light scattering ceramic sphere material, a solvent-based thinner and a vinyl resin-based coating material, said vinyl resin-based coating material including (by weight) about 20-25% vinyl resins, about 35-40% aromatic petroleum distillates, about 5-10% cyclohexanone, about 5-10% diacetone alcohol, about 5-10% gamma butyrolactone, less than about 5% napthalene, and about 2% aliphatic petroleum distillates, and said thinner comprising all of the components of said coating material at the same ratios, with the exception of said vinyl resins which are not present in said thinner, said dye, said blue colorant, said red colorant, said UV absorber. said preservative, said ceramic sphere material, said thinner and said vinyl resin-based coating material being present in said filtering mixture at respective proportions of about 69:7.2:6:30:30:780:300:4777.8 by weight;

(2) said light filtering coating formed on one of said second surfaces is made from a pearlescent ink;

(3) said light filtering coating formed on the other of said second surfaces is made from a light scattering mixture that includes an organic solvent-soluble pearlescent pigment, an organic solvent-soluble fluorescent whitening agent, a powdered silica material, and a vinyl resin-based coating material, said vinyl resin-based coating material including (by weight) about 20-25% vinyl resins, about 35-40% aromatic petroleum distillates, about 5-10% cyclohexanone, about 5-10% diacetone alcohol, about 5-10% gamma butyrolactone, less than about 5% napthalene, and about 2% aliphatic petroleum distillates, said pearlescent pigment, said fluorescent whitening agent, said powdered silica material, and said vinyl resin-based coating material being present in said light scattering mixture at respective proportions of about 101:25:5:869 by weight; and

(4) said card has an opacity of approximately 0.7 over a wavelength range of about 400-750 nm, approximately 1.5 at a wavelength of about 890 nm, and approximately 1.6 at a wavelength of about 950 nm.

88. The financial transaction card of Claim 75 wherein:

(1) there is a light filtering coating formed on each of said first surfaces that is made from a filtering mixture that includes an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble Ultraviolet (UV) light absorber, a BHT preservative, a light scattering ceramic sphere material, a solvent-based thinner and a vinyl resin-based coating material, said vinyl resin-based coating material including (by weight) about 20-25% vinyl resins, about 35-40% aromatic petroleum distillates, about 5-10% cyclohexanone, about 5-10% diacetone alcohol, about 5-10% gamma butyrolactone, less than about 5% napthalene, and about 2% aliphatic petroleum distillates, and said thinner comprising all of the components of said coating material at the same ratios, with the exception of said vinyl resins which are not present in said thinner, said dye, said UV absorber, said preservative, said ceramic sphere material, said thinner and said vinyl resin-based coating material being present in said filtering mixture at respective proportions of about 15:5:5:130:50:795 by weight; and

(2) said card has an opacity of approximately 0.2 over a wavelength range of about 400-750 nm, approximately 1.4 at a wavelength of about 890 nm, and approximately 1.9 at a wavelength of about 950 nm.

89. The financial transaction card of Claim 75 wherein:

(1) there is a light filtering coating formed on each of said first surfaces that is made from a filtering mixture that includes an organic solvent-soluble, near Infrared absorption dye, an organic solvent-soluble blue colorant, an organic solvent soluble red colorant, an organic solvent-soluble Ultraviolet (UV) light absorber, a BHT preservative, a light scattering ceramic sphere material, a solvent-based thinner and a vinyl resin-based coating material, said vinyl resin-based coating material including (by weight) about 20-25% vinyl resins, about 35-40% aromatic petroleum distillates, about 5-10% cyclohexanone, about 5-10% diacetone alcohol, about 5-10% gamma butyrolactone, less than about 5% napthalene, and about 2% aliphatic petroleum distillates, and said thinner comprising all of the components of said coating

material at the same ratios, with the exception of said vinyl resins which are not present in said thinner, said dye, said blue colorant, said red colorant, said UV absorber, said preservative, said ceramic sphere material, said thinner and said vinyl resin-based coating material being present in said filtering mixture at respective proportions of about 12:3.75:2.75:5:5:130:50:791.5 by weight; and

(2) said card has an opacity of approximately 0.5 over a wavelength range of about 400-750 nm, approximately 1.1 at a wavelength of about 890 nm, and approximately 1.6 at a wavelength of about 950 nm.

90. The financial transaction card of Claim 75 wherein:

(1) there is a light filtering coating formed on each of said first surfaces that is made from a filtering mixture that includes an organic solvent-soluble, near Infrared absorption dye, a solvent-based liquid blue colorant, an organic solvent-soluble blue colorant, an organic solvent-soluble red colorant, an organic solvent-soluble Ultraviolet (UV) light absorber, a BHT preservative, a light scattering ceramic sphere material, a solvent-based thinner and a vinyl resin-based coating material, said vinyl resin-based coating material including (by weight) about 20-25% vinyl resins, about 35-40% aromatic petroleum distillates, about 5-10% cyclohexanone, about 5-10% diacetone alcohol, about 5-10% gamma butyrolactone, less than about 5% napthalene, and about 2% aliphatic petroleum distillates, and said thinner comprising all of the components of said coating material at the same ratios, with the exception of said vinyl resins which are not present in said thinner, said dye, said liquid blue colorant, said blue colorant, said red colorant, said UV absorber, said preservative, said ceramic sphere material, said thinner and said vinyl resin-based coating material being present in said filtering mixture at respective proportions of about 12:20:3.75:2.75:5:5:130:50:771.5 by weight; and

(2) said card has an opacity of approximately 0.6 over a wavelength range of about 400-750 nm, approximately 1.3 at a wavelength of about 890 nm, and approximately 1.8 at a wavelength of about 950 nm.